

## **Appendix 6D**

### **Equations and Codes Used in Model**

**Table 6D-1. Equations Used in the Model**

Index	Risk Variable	Equation	Lowest Risk	Highest Risk
<b>Risk Total</b>	<b>IndexSum</b>	(ThdPtySum + DesignSum + CorrSum + IncOpsSum) * (1 - [leaks_unknown]/10)	400	0
	<b>Risk</b>	IndexSum / LIF	1000+	0
<b>Third Party</b>	<b>ThdPtySum</b>	([depth_cover] + [activity] + [exposed_facilities] + [one_call] + [patrol] + [public_edn] + [ROW_cond]) * (if([leak]=1,0.9,if([leak]=5,0.9,1)))*[repair_thd_pty]	100	0
	depth_cover	[cover]*4	20	0
	activity	1/([utilities] + [one_calls] + [pop]+0.5)*15 + [activity_WPC]/2	20	0
	exposed_facilities	[abv_grnd_WPC]/2 + if([cover]=1,0,5)	10	0
	one_call	[one_call_score]	15	0
	public_edn	[public_ed]	15	0
	ROW_cond	[ROW]	5	0
	patrol	([grnd_patrl_freq] * [grnd_patrl_eff]) + ([air_patrl_freq] * if([ROW]<3,0.5,[air_patrl_eff]))	15	0
<b>Corrosion</b>	<b>CorrSum</b>	([atmos_corr] + [buried_environ] + [internal_corr] + [cath_prot] + [coating_buried] + [interference] + [mech_corr] + [ILI]) * (if([leak]=2,0.9,if([leak]=7,0.9,if([leak]=5,0.9,1)))) * [ILI_corr_flaw]*[repair_corr] * (if([yr]<94,0.8,1))	100	0
	atmos_corr	if([atm_facilities]>0,([atm_corr]+[atm_coating]),10)	10	0
	buried_environ	if([casings]>0,0,[soil_corr])	10	0
	internal_corr	([prod_corr]+if([drain]=1,0,5))*if([yr]<94,.5,1)	20	0
	cath_prot	([CIS] + [test_lead])/2*[ILI_corr_flaw]	15	0
	coating_buried	([CIS]/2+[test_lead]/2+[coat_type]*[coat_age])*if([coat_insp]>0,if([coat_insp]>5,1,0.8),0.2) * ([ILI_corr_flaw])	15	0
	age		0	0
	interference	if([yr]>=98,5,1)+if((([utilities]+[casings])=0,8,if((([utilities]+[casings])<5,3,0)))	15	0
	mech_corr	([soil_corr] + [pipe_stress_fatigue])/3	5	0
	ILI	if([yr]>=98,10,[ILI_age]*[ILI_tech] )	10	0
	CIS	[CIS_reading]*if([yr]>=98,1,[CIS_age])	10	0
	atm_corr	if([casings]>0,0,[atm_type])	5	0
	test_lead		10	0
coat_insp	if([yr]>=98,12,[89coat_insp]+[90coat_insp]+[91coat_insp]+[92coat_insp]+[93coat_insp]+[94coat_insp]+[95coat_insp]+[96coat_insp]+[97coat_insp]+[98coat_insp])	20	0	
casings	[casing_shorted] + [casing_unchecked] + [casing_clear]	count	0	
atm_facilities	if([casings]>0,1,0)+[shallow_cover]+if([abv_grnd_WPC]<10,1,0)+if([coat_type]=1,1,0)			

**Table 6D-1. Equations Used in the Model (Continued)**

Index	Risk Variable	Equation	Lowest Risk	Highest Risk
<b>Design</b>	<b>DesignSum</b>	$([\text{pipe\_fctr}] + [\text{sys\_fctr}] + [\text{fatigue}] + [\text{surge}] + [\text{integrity\_test}] + [\text{earth\_mvmnts}]) * (\text{if}([\text{leak}]=3,0.9,\text{if}([\text{leak}]=8,0.9,\text{if}([\text{leak}]=5,0.9,1)))) * [\text{repair\_design}]$	100	0
	pipe_fctr	$\text{if}([\text{pipe\_maxpress}]/[\text{MOP}] < 1,0,\text{if}([\text{pipe\_maxpress}] / [\text{MOP}] > 2,20,([\text{pipe\_maxpress}] / [\text{MOP}] - 1)*20)*[\text{ILI\_design\_flaw}]$	20	0
	sys_fctr	$\text{if}([\text{max\_press}]/[\text{MOP}] < 1,0,\text{if}([\text{max\_press}] / [\text{MOP}] > 2,10,([\text{max\_press}]/[\text{MOP}] - 1)*10)*[\text{ILI\_design\_flaw}]$	10	0
	fatigue	$[\text{pump\_dist\_72}] + \text{if}([\text{yr}] \geq 94,5,([\text{integrity\_test}]/4) + [\text{pipe\_stress\_fatigue}]$	15	0
	surge	$[\text{surge\_score}] + [\text{pipe\_stress\_surge}]$	15	0
	integrity_test	$\text{if}([\text{hydro\_test}] + [\text{crack\_ILI}] > 20,20,([\text{hydro\_test}] + [\text{crack\_ILI}])$	20	0
	earth_mvmnts	$[\text{scour}] + [\text{seismic}] + [\text{landslide\_potential}]$	20	0
	hydro_test	$\text{if}([\text{hydro\_ratio}] * [\text{hydro\_age}] < 0,0,([\text{hydro\_ratio}] * [\text{hydro\_age}]))$	20	
	crack_ILI	$[\text{crack\_ILI\_age}] * [\text{crack\_ILI\_type}]$	20	
	max_press	$\text{if}([\text{pipe\_maxpress}] < [\text{other\_maxpress}], [\text{pipe\_maxpress}], [\text{other\_maxpress}])$		
<b>Incorrect Ops</b>	<b>IncOpsSum</b>	$([\text{construction\_design}] + [\text{training}] + [\text{procedures}] + [\text{maps\_records}] + [\text{overpress\_pot}] + [\text{safety\_sys}] + [\text{maint}] + [\text{communications}] + [\text{mech\_err\_prev}] + [\text{risk\_ass}]) * (\text{if}([\text{leak}]=4,0.9,\text{if}([\text{leak}]=5,0.9,1))))$	100	0
	construction_design	$[\text{construction\_design\_score}]$	10	0
	training	$[\text{training\_score}]$	20	0
	procedures	$[\text{procedures\_score}]$	15	0
	maps_records	$[\text{maps\_records\_score}]$	5	0
	overpress_pot	$([\text{surge\_score}] * 5 / 7.5) + [\text{pipe\_stress\_fatigue}] + [\text{ov\_press\_pot}] / 3$	10	0
	safety_sys	$[\text{safety\_sys\_score}]$	10	0
	maint	$[\text{maint\_score}]$	10	0
	communications	$[\text{communications\_score}]$	10	0
	mech_err_prev	$[\text{mech\_err\_prev\_score}]$	5	0
risk_ass	$[\text{risk\_ass\_score}]$	5	0	
<b>LIF</b>	<b>LIF</b>	$[\text{prod\_haz}] * [\text{spill}] * [\text{spread}] * [\text{receptors}]$	0	1250
	prod_haz	$([\text{acute}] / 12 + [\text{chronic}] / 10) * 2.5$	0	5
	spill	$([\text{flow\_volume}] + [\text{drain\_volume}] + [\text{leak\_detect\_volume}]) / 2000$	0	5
	spread	$[\text{overland}] + [\text{subsurface}]$	0	5
	overland			
	buffer_recept			
	spread_recept			
	receptors	$(2/3) * ([\text{pop}] + [\text{aquifer\_sens}] + [\text{stream\_sens}])$	0	10

**Table 6D-1. Equations Used in the Model (Continued)**

Index	Risk Variable	Equation	Lowest Risk	Highest Risk
Data	activity_WPC		15	
	air_patrl_eff		1	
	air_patrl_freq		15	
	atm_coating		5	
	atm_coating		5	
	atm_type		5	
	casings			
	CIS_age	$\text{if}(\text{year}(\text{NOW}()) - ([\text{CIS\_date}]) > 5, 0, (1 - (\text{year}(\text{NOW}()) - ([\text{CIS\_date}]))) / 5)$		
	CIS_reading	$\text{if}([\text{yr}] \geq 98, 10, [\text{CIS\_98}])$	10	
	coat_age	$\text{if}(99 - [\text{yr}] < 5, 1, \text{if}(99 - [\text{yr}] < 10, 0.8, \text{if}(99 - [\text{yr}] < 20, 0.6, \text{if}(99 - [\text{yr}] < 50, 0.4, 0.2)))$		
	coat_type		5	
	crack_ILI_age	$\text{if}(\text{year}(\text{NOW}()) - \text{year}([\text{crack\_ILI\_date}]) > 5, 0, (1 - (\text{year}(\text{NOW}()) - \text{year}([\text{crack\_ILI\_date}]))) / 5)$	#	
	crack_ILI_date			
	crack_ILI_type		20	
	cover		20	
	drain_volume	$3000 / [\text{drain}]$		
	flow_volume	$[\text{flowrate}] / 24 * 0.25$		
	grnd_patrl_eff		1	
	grnd_patrl_freq		15	
	hydro_age	$\text{if}(\text{year}(\text{NOW}()) - \text{year}([\text{hydro\_date}]) > 5, 0, (1 - (\text{year}(\text{NOW}()) - \text{year}([\text{hydro\_date}]))) / 5)$	#	
	hydro_date			
	hydro_press		#	
	hydro_ratio	$\text{if}([\text{hydro\_press}] / [\text{MOP}] > 1.5, 0.5, ([\text{hydro\_press}] / [\text{MOP}] - 1) * 40)$	20	
	ILI_95		10	
	ILI_age	$\text{if}(\text{year}(\text{NOW}()) - \text{year}([\text{ILI\_date}]) > 5, 0, (1 - (\text{year}(\text{NOW}()) - \text{year}([\text{ILI\_date}]))) / 5)$		
	ILI_corr_flow	$\text{if}([\text{ILI\_flow}] = 7, 0.9, \text{if}([\text{ILI\_flow}] = 0, \text{if}([\text{yr}] \geq 98, 1.0, 0.9), 1))$		
	ILI_design_flow	$\text{if}([\text{ILI\_flow}] = 8, 0.9, \text{if}([\text{ILI\_flow}] = 9, 0.9, \text{if}([\text{ILI\_flow}] = 0, 0.9, 1)))$		
	ILI_flow	$\text{if}([\text{ILI\_95}] = 10, \text{if}([\text{yr}] \geq 98, 10, (1 - ([\text{ILI\_age}] / 10)), [\text{ILI\_95}])$	10	
	ILI_tech		10	
	joint_fctr			
	landslide_potential		6.6667	
	leak_detect_volume	$[\text{leak\_detect\_rate}] * [\text{leak\_detect\_time}] * [\text{flowrate}] / 24$		

**Table 6D-1. Equations Used in the Model (Continued)**

Index	Risk Variable	Equation	Lowest Risk	Highest Risk
<b>Data</b>	MOP			
	MOP%_gas_72		10	
	one_call_score		15	
	one_calls		5	
	other_maxpress			
	pipe design factor			
	pipe_Barlow1	[pipe_barlow]		
	pipe_maxpress	[pipe_barlow] * (if([yr]<72, (if([pipe_seam] = 1, (if([integrity_test] < 5, 0.8, 0.95)), 0.95)),0.95))		
	pipe_NOP			
	pipe_seam			
	pipe_stress_fatigue	[MOP%_gas_72]/2	5	
	pipe_stress_surge	[MOP%_gas_72]*.75	7.5	
	pipe_toughness			
	pop_activ		5	
	public_ed		15	
	pump_dist_72		5	0
	repair_corr	if([repair_ind] = 2, 0.9,if([repair_ind]=5,0.9,if(repair_ind=6,0.9,1)))		
	repair_design	if([repair_ind] = 3, 0.9,if([repair_ind]=5,0.9,if(repair_ind=6,0.9,1)))		
	repair_multiple			
	repair_thd_pty	if([repair_ind] = 1, 0.9,if([repair_ind]=5,0.9,if(repair_ind=6,0.9,1)))		
	repair_unknown			
	scour		6.6667	
	seismic	if((5-[seismic_PGA]/4)<0,0,(5-[seismic_PGA]/4))	5	0
	shallow_cover	if([cover]=0,1,0)		
	surge_score		7.5	

**Table 6D-2. Codes Used in the Model**

<b>Event</b>	<b>Code</b>	<b>Points</b>	<b>Description</b>	<b>% Of Scale</b>	<b>Max Pts</b>
cover_actual	#		actual inches of cover		19
pump_dist_72	1	0	0-2 miles from discharge of pump	0	5
pump_dist_72	2	1.5	2-4 miles from discharge of pump	0.3	5
pump_dist_72	3	2.5	4-6 miles from discharge of pump	0.5	5
pump_dist_72	4	3.5	6-8 miles from discharge of pump	0.7	5
pump_dist_72	5	5	>8 miles from discharge of pump	1	5
drain	1	1	>8000	0	
drain	2	2	6000-8000	0.3	
drain	3	3	4000-6000	0.5	
drain	4	4	2000-4000	0.7	
drain	5	5	<2000	1	
cover	1	0	0 (exposed)	0	20
cover	2	4	0-18"	0.2	20
cover	3	8	19-36"	0.4	20
cover	4	12	>36"	0.6	20
MOP%_gas_72	5	10	<70% of MAOP	1	10
MOP%_gas_72	4	7	70-80% of MAOP	0.7	10
MOP%_gas_72	3	5	80-90% of MAOP	0.5	10
MOP%_gas_72	2	3	90-100% of MAOP	0.3	10
MOP%_gas_72	1	0	>100% of MAOP	0	10
surge_score	5	7.5	<100 % of MAOP	1	7.5
surge_score	4	5.25	100-110 % of MAOP	0.7	7.5
surge_score	3	3.75	110-120 % of MAOP	0.5	7.5
surge_score	2	2.25	120-130 % MAOP	0.3	7.5
surge_score	1	0	>130 % MAOP	0	7.5
age	#				0
pipe_MOP	#				
ILI_95	EC	7	EXTERNAL CORROSION		10
ILI_95	IL	8	INTERNAL LAMINATION		10

**Table 6D-2. Equations Used in the Model (Continued)**

Event	Code	Points	Description	% Of Scale	Max Pts
ILI_95	NCF	9	NON CORROSION FLAW		10
ILI_95	NF		NOTHING FOUND		10
ILI_95	PC		PASSED CORCALC		10
ILI_95	FC		FAILED CORCALC		10
ILI_95	CAN		CORCALC NOT APPLICABLE		10
ILI_95	RC		REPAIRED COATING		10
ILI_95	MRR		MECHANICAL REINFORCEMENT REPAIR		10
ILI_95	PCR		PRESSURE CONTAINMENT REPAIR		10
ILI_95	none	10			10
ILI_95	no_data	0			10
repair_ind	corr	2	corrosion related, CIS, cathodic protection		
repair_ind	upgrade	10	equipment replace (except pipe), instrumentation install, etc.		
repair_ind	leak	5			
repair_ind	exposure		erosion, sandbags, etc		
repair_ind	unknown	5	full encirclement sleeves, purging, moving pipeline, pipe replacement with no cause shown		
repair_ind	corr-leak	2	both leak and heavy corrosion		
repair_ind	test		intrusive testing, hydrostatic testing		
repair_ind	mult	6			
repair_ind	none	0			
repair_ind					
repair_ind					
repair_year	#				
atm_type	none	0	nothing exposed		5
atm_type	GC	0	gulf coast	0	5
atm_type	HC	2.5	hill country	0.5	5
atm_type	A	5	arid	1	5
atm_facilities	none	0			0
atm_facilities	casings	0			0

**Table 6D-2. Equations Used in the Model (Continued)**

Event	Code	Points	Description	% Of Scale	Max Pts
atm_facilities	support	0			0
atm_coating	G	0			5
atm_coating	F	0			5
atm_coating	excellent	5		1	5
tl_distance	#		distance to nearest test lead		
cis94	okay		either by 850 or 100 shift		
cis94	bad		either by 850 or 100 shift		
CIS_98	okay	10	850 criteria	1	10
CIS_98	unchecked	1		0.1	10
CIS_98	bad	0	850 criteria	0	10
coat_inspect	yr-bad		disbonded, loose, brittle		
coat_inspect	yr-fair		wrinkles but tight		
coat_inspect	yr-good				
coat_inspect	yr-new				
coat_inspect	yr-bad-replaced				
coat_inspect	yr-fair-replaced				
coat_inspect	yr-good-replaced				
coat_inspect	none				
coat_type	TFG	2	includes age considerations	0.4	5
coat_type	FBE	5	fusion bonded epoxy	1	5
coat_type	coal tar	1.5		0.3	5
coat_type	unknown	1.5		0.3	5
coat_type	COAL TAR	1.5		0.3	5
coat_type	EPOXY/PE	5		1	5
coat_type	EPOXY/PE-2040 LILLY	5		1	5
coat_type	EPOXY/PE-POWERCRETE	5		1	5
coat_type	PLASTIC TAPE	1.5		0.3	5
coat_type	Powercrete-J	1		0.2	5
coat_type	PAINT	1		0.2	5
coat_type	EPOXY/PE/FBE	5		1	5

**Table 6D-2. Equations Used in the Model (Continued)**

<b>Event</b>	<b>Code</b>	<b>Points</b>	<b>Description</b>	<b>% Of Scale</b>	<b>Max Pts</b>
coat_type	COAL TAR/PLASTIC TAPE	3		0.6	5
coat_type	Paint/Powercrete-J	3		0.6	5
coat_age	#				0
mpy_score	#		coupon readings		
prod_corr	H	0.75		0.05	15
prod_corr	M	6		0.4	15
prod_corr	L	13.5		0.9	15
prod_corr	LPP	13.5	also considers preventions	0.9	15
us_inspect	untested		ultrasonic inspections		
us_inspect	tested-ok		ultrasonic inspections		
us_inspect	tested-bad		ultrasonic inspections		
casing	none				
casing	shorted				
casing	unchecked				
casing	clear				
leaks_corr	#		pitting		
leaks_thd_pty	#		dents, gouges, etc		
leaks_inc_ops	#		human errors		
leaks_earth_mvmts	#		flooding, landslides, etc		
leaks_design	#		cracks, laminations, blisters		
leaks_unknown	#				
pipe_NOP	#		normal op press		0
pipe_MOP	#		max op press		
pipe_wall	#		nominal wall		
pipe_dia	#		outside diameter		
pipe_SMYS	#				
pipe_ext_load	#		% wall allowance for external loads		
pipe_manufctr					
pipe_manufctr					
pipe_year	#				

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**Table 6D-2. Equations Used in the Model (Continued)**

Event	Code	Points	Description	% Of Scale	Max Pts
pipe_Barlow	#		max press calculation, $P = 2St/d$		
ILI_wall_loss	#		wall loss per ILI		
ILI_ind	crack				
ILI_ind	dent/gouge				
ILI_ind	TSI				
ILI_date	#				
pipe_maxpress	#		pipe max pressure, no safety factor		0
other_maxpress	#		component pressure rating		0
pipe_toughness	okay	0			0
pipe_toughness	poor	0			0
pipe_toughness	unknown	0			0
pipe_D/t	high				
pipe_D/t	low				
pipe_D/t_fatigue	100+		greater than 100		
pipe_D/t_fatigue	-100		less than 100		
pipe_crack_pig	#				
pump_sta_dist	#				
surge_score	high	0	conditions favorable		7.5
surge_score	med	0	rare, small in magnitude		7.5
surge_score	none	0	impossible to create high surge		7.5
surge_prev	NA		not needed--high surge impossible		
surge_prev	high		effective, redundant		
surge_prev	med				
surge_prev	low		questionable effectiveness		
hydro_ratio	#				20
hydro_age	#				#
water_xing	major		scour potential, oxbow potential, bank erosion		
water_xing	med		small, relatively stable		
water_xing	minor		very small, stable, periods of no flow		
water_xing	none				

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**Table 6D-2. Equations Used in the Model (Continued)**

Event	Code	Points	Description	% Of Scale	Max Pts
water_xing_depth	drilled		deep with no bank exposure potential		
water_xing_depth	conventional				
landslide_potential	high	0	landslide or washout potential	0	6.666667
landslide_potential	med	1.333333333		0.2	6.666667
landslide_potential	low	2.666666667		0.4	6.666667
landslide_potential	none	4		0.6	6.666667
seismic	active	0			5
seismic	known	0			5
seismic	none	0			5
pipe_stress_fatigue		0			5
pipe_stress_surge		0			7.5
pipe_seam	ERW	1			0
pipe_seam	SMLS	0			0
crack_ILI_date					0
crack_ILI_age					#
crack_ILI_type	none	0			20
scour	none	6.666666667		1	6.666667
scour	low	2.666666667		0.4	6.666667
scour	mod	1.333333333		0.2	6.666667
scour	higher	0		0	6.666667
yr	#				
pop_activ	low	5	population density contribution to activity level	1	5
pop_activ	med	2.5		0.5	5
pop_activ	high	0		0	5
pop	low	0.5		0.1	5
pop	medium	2.5		0.5	5
pop	high	5		1	5
abv_grnd_WPC	#		from WPC 1999 risk assessment		
shallow_cover	yes	0	if cover = 1		0
shallow_cover	none	0	if cover < 1		0

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**Table 6D-2. Equations Used in the Model (Continued)**

<b>Event</b>	<b>Code</b>	<b>Points</b>	<b>Description</b>	<b>% Of Scale</b>	<b>Max Pts</b>
soil_corr	HIGH	0		0	10
soil_corr	MODERATE	5		0.5	10
ROW	poor	0		0	5
ROW	fair	1.75		0.35	5
ROW	good	3.25		0.65	5
ROW	excellent	5		1	5
one_call_score	LPP	13	rating from WPC risk ass.		15
public_ed	LPP	11	rating from WPC risk ass.		15
grnd_patrl_freq	LPP	0	no formal program		15
grnd_patrl_eff	LPP	0			1
air_patrl_freq	LPP	6	weekly		15
air_patrl_eff	LPP	1	good		1
activity_WPC	LPP	#			15
89coat_inspect	good-replaced	2			
89coat_inspect	unknown	0.5			
89coat_inspect	good	2			
89coat_inspect	bad-replaced	2			
89coat_inspect	fair-replaced	2			
89coat_inspect	bad	0			
89coat_inspect	fair	0.5			
90coat_inspect	good-replaced	2			
90coat_inspect	unknown	0.5			
90coat_inspect	good	2			
90coat_inspect	bad-replaced	2			
90coat_inspect	fair-replaced	2			
90coat_inspect	bad	0			
90coat_inspect	fair	0.5			
91coat_inspect	good-replaced	2			
91coat_inspect	unknown	0.5			
91coat_inspect	good	2			

**Table 6D-2. Equations Used in the Model (Continued)**

<b>Event</b>	<b>Code</b>	<b>Points</b>	<b>Description</b>	<b>% Of Scale</b>	<b>Max Pts</b>
91coat_inspect	bad-replaced	2			
91coat_inspect	fair-replaced	2			
91coat_inspect	bad	0			
91coat_inspect	fair	0.5			
92coat_inspect	good-replaced	2			
92coat_inspect	unknown	0.5			
92coat_inspect	good	2			
92coat_inspect	bad-replaced	2			
92coat_inspect	fair-replaced	2			
92coat_inspect	bad	0			
92coat_inspect	fair	0.5			
93coat_inspect	good-replaced	2			
93coat_inspect	unknown	0.5			
93coat_inspect	good	2			
93coat_inspect	bad-replaced	2			
93coat_inspect	fair-replaced	2			
93coat_inspect	bad	0			
93coat_inspect	fair	0.5			
94coat_inspect	good-replaced	2			
94coat_inspect	unknown	0.5			
94coat_inspect	good	2			
94coat_inspect	bad-replaced	2			
94coat_inspect	fair-replaced	2			
94coat_inspect	bad	0			
94coat_inspect	fair	0.5			
95coat_inspect	good-replaced	2			
95coat_inspect	unknown	0.5			
95coat_inspect	good	2			
95coat_inspect	bad-replaced	2			
95coat_inspect	fair-replaced	2			

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**Table 6D-2. Equations Used in the Model (Continued)**

<b>Event</b>	<b>Code</b>	<b>Points</b>	<b>Description</b>	<b>% Of Scale</b>	<b>Max Pts</b>
95coat_inspect	bad	0			
95coat_inspect	fair	0.5			
96coat_inspect	unknown	0.5			
96coat_inspect	good	2			
97coat_inspect	unknown	0			
98coat_inspect	new	2			
98coat_inspect	unknown	0.5			
CIS_reading	bad	0		0	10
CIS_reading	okay	10		1	10
CIS_reading	unchecked	2		0.2	10
leak	leaks_unknown	5			
leak	none	0			
leak	leaks_unknown leaks_design	8			
leak	leaks_thd_pty	1			
leak	leaks_corr leaks_unknown	7			
leak	leaks_inc_ops	4			
leak	leaks_design	3			
leak	leaks_corr	2			
ILI_tech	LPP	5		0.5	10
prod_corr	LPP	8			10
atm_coating	good	3.75		0.75	5
atm_coating	fair	2		0.4	5
atm_coating	poor	0		0	5
construction_design_score	LPP-old	4		0.5	10
construction_design_score	LPP-new	8		1	10
training_score	LPP	16		0.8	20
procedures_score	LPP	12		0.8	15
maps_records_score	LPP	4		0.8	5
overpress_pot_score	LPP	8		0.8	10
safety_sys_score	LPP	5		0.5	10

**Table 6D-2. Equations Used in the Model (Continued)**

Event	Code	Points	Description	% Of Scale	Max Pts
maint_score	LPP	8		0.8	10
communications_score	LPP	8		0.8	10
mech_err_prev_score	LPP	0		0	5
risk_ass_score	LPP	4		0.8	5
risk_ass_score		0			
flowrate	#				
leak_detect_volume		0			
drain_volume	#				
leak_detect_rate	#				
leak_detect_time	#				
overland	1	0.125	best case	0.05	2.5
overland	2	0.75	particle trace analysis	0.3	2.5
overland	3	1.25	distance x slope x flow resistance	0.5	2.5
overland	4	1.75		0.7	2.5
overland	5	2.5	worst case	1	2.5
subsurface	1	0.125	chap 5 table, Jeff Irvin	0.05	2.5
subsurface	2	0.75	1=best	0.3	2.5
subsurface	3	1.25		0.5	2.5
subsurface	4	1.75		0.7	2.5
subsurface	5	2.5	5=worst	1	2.5
acute	#	1.666666667			2.5
chronic	#	1			2.5
test_lead	bad	2		0.2	10
test_lead	good/unknown	8		0.8	10
test_lead	bad_multiple	0		0	10
one_calls	High	0		0	5
one_calls	Medium	2.5		0.5	5
one_calls	Low	4.5		0.9	5
stream_sens	non-sensitive	0	whether or not the particle trace goes to a sensitive stream (defined by J. Irvin)		

**Table 6D-2. Equations Used in the Model (Continued)**

<b>Event</b>	<b>Code</b>	<b>Points</b>	<b>Description</b>	<b>% Of Scale</b>	<b>Max Pts</b>
stream_sens	sensitive	5	1-5 pt scale		
aquifer_sens	#		1-5 pt scale		
ov_press_pot	low	5			
ov_press_pot	high	0			

